ANESTHETIC HYPOTENSION

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ANESTHETIC HYPOTENSION
(MABP ≤60 mm Hg)

DIAGNOSIS
Low SVR (ie, too much vasodilation)

DIFFERENTIAL
Sympathetic blockade
(epidural/spinal anesthetics)

TREATMENT
Reduce inhalants 1-5; use vasopressors to treat vasodilation, fluids for relative hypovolemia correction

DIFFERENTIAL
Vasodilation from drug (eg, acepromazine, propofol, alfaxalone, inhalant)

TREATMENT
Reduce anesthetic doses, balance anesthetic technique

DIFFERENTIAL
Patient-related conditions (eg, sepsis, SIRS, toxins, histamine release)

TREATMENT
Use vasopressors to treat vasodilation, fluids to treat relative hypovolemia correction, antihistaminics or steroids to treat histamine release

Pertinent Calculations
- Blood pressure = CO × SVR
- CO = SV × HR

CO = cardiac output
HR = heart rate
MABP = mean arterial blood pressure
SIRS = systemic inflammatory response syndrome
SV = stroke volume
SVR = systemic vascular resistance

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**ANESTHETIC HYPOTENSION (MABP ≤60 mm Hg)**

**DIAGNOSIS**
Low cardiac output

**DIFFERENTIAL**
- Increased intrathoracic pressure, IPPV, pneumothorax, intrathoracic mass

**TREATMENT**
- Use positive inotropes (e.g., ephedrine, dobutamine, dopamine, epinephrine)

**DIFFERENTIAL**
- Anesthetic drugs, inhalants, injectables (e.g., halothane, thiopental, α-2 agonists, propofol, ketamine in catecholamine-depleted patients)

**TREATMENT**
- Avoid strong cardiovascular suppressant drugs, reduce anesthetic doses, balance anesthetic technique

**INVESTIGATION**
- Spontaneous breathing, low-tidal volume IPPV, permissive hypercapnia,* no PEEP

**TREATMENT**
- Thoracocentesis if fluid present, remove mass

**DIAGNOSIS**
Low contractility

**DIFFERENTIAL**
- High afterload

**TREATMENT**
- Reduce vasopressors and α-2 agents

**DIFFERENTIAL**
- Low preload (low venous return, low-end diastolic volume)

**TREATMENT**
- Vasopressors (e.g., phenylephrine, vasopressin, norepinephrine) to treat vasodilation; crystalloids, colloids, blood products

**DIFFERENTIAL**
- Patient-related conditions (aorta caval compression)

**TREATMENT**
- Dorsal recumbency for obese/pregnant/ascitic/abdominal mass patients; iatrogenic, surgical manipulation

**TREATMENT**
- Tilt operation table, treat mass/pressure, add bolus of crystalloids

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AV = atrioventricular
BOAS = brachycephalic obstructive airway syndrome
MABP = mean arterial blood pressure
IPPV = intermittent positive pressure ventilation
PEEP = positive end-expiratory pressure

*Permissive hypercapnia is a ventilation strategy in which oxygenation is prioritized over expired carbon dioxide. Higher than normal carbon dioxide levels are allowed because of low ventilation that preserves the lungs.
DIAGNOSIS
Inadequate heart rate and rhythm

Bradycardia

INVESTIGATION
Inadequate ventricular filling if heart rate too high

Tachycardia

No synchrony on atrial or ventricular contraction

Arrhythmias

DIFFERENTIAL
Anesthetic drugs (eg, ketamine, alfaxalone, sympathomimetic drugs)

TREATMENT
Stop/decrease drugs, avoid use

DIFFERENTIAL
Patient-related condition (eg, hypovolemia, hyperthermia, hypoxemia, hypercapnia, pain, cardiac disease)

TREATMENT
Replace volume, cool patient, administer IPPV and 100% oxygen analgesia; if all are normal but cardiac disease, use antiarrhythmics

DIFFERENTIAL
Increased vagal tone (GI stimulation, cervical surgeries, respiratory disease, IPPV, oculocardiac reflex, breed predisposition [BOAS])

TREATMENT
Stop vagal stimulus; use anticholinergics (eg, atropine, glycopyrrolate)

DIFFERENTIAL
Anesthetic drugs (propofol, opioids, α-2 agonists)

TREATMENT
Avoid strong cardiovascular suppressant drugs, lower doses, or reverse drugs; use anticholinergics (eg, atropine, glycopyrrolate) or sympathomimetics if anticholinergics ineffective

DIFFERENTIAL
AV blocks, atrial fibrillation, ventricular arrhythmias

TREATMENT
Treat arrhythmia

DIFFERENTIAL
Patient-related condition (hypothermia, hyperkalemia end-stage metabolic disease, cardiac disease, extreme hypoxemia)

TREATMENT
Warm patient, treat hyperkalemia, use anticholinergics, improve oxygenation

See page 116 for references.
References


Suggested Reading


Why is it so SMART?

- Intelligent Image Processing for consistently high image quality.
- On board help videos and tutorials.
- New users up to speed in 20 mins.
- 3D Position Assistant for accuracy and consistency.